

**Patuxent Wildlife Research Center**  
**Science Brief for Resource Managers**

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## **Mercury in tree swallows and feathers of other species that line tree swallow nests at Acadia National Park, Maine**

### **Description:**

Objectives: To characterize the extent of mercury contamination and transfer from lower trophic levels (i.e., aquatic insects) to the insectivorous tree swallow, and to evaluate the potential of using feathers of other species that are collected by tree swallows to insulate their nests to characterize mercury contamination in the surrounding avian community. It was possible to add additional data by keeping the Acadia NP study site as a control site for comparison to a Superfund site in MA being evaluated in a companion study.

### **Progress to Date:**

Laboratory work included the preparation of carcass, egg, food boli, and plumage samples for analyses for mercury. Data include shell data, laying and hatching dates, egg measurements, nestling measurements for assessment of growth, clutch size, hatchability, and fledging success. All feathers used as nest lining were identified by collaborators from the National Museum of Natural History, as from 13 different avian species. All primary data have been analyzed, including those related to effects of mercury on growth of tree swallow nestlings, differences in residues among tissues and sampling locations, and differences between locations in reproductive performance. Analyses of subsamples of feathers were completed to determine that total mercury was essentially all methyl mercury; the biologically active form of mercury. Key findings were that the largest amounts of methyl mercury were detected in insect foods, eggs, carcasses, and feathers from tree swallows at wetlands on Acadia National Park. The next highest amounts were at the superfund site in Devens, MA, followed by lower levels at the Orono, ME site and at Seal Cove pond at Acadia. Because mercury is transported through the carcass and sequestered in the feathers as nestlings mature,

survival of nestings that hatch is high, whereas some eggs do not hatch, but lowered hatchability can not be singly ascribed to amount of mercury in the egg.

### **Management Implications:**

The toxic, biologically active methyl mercury continues to contaminate aquatic food chains. Mercury is transferred from insect foods to breeding tree swallows where it is biomagnified in eggs and carcasses, but especially feathers. Curtailing air pollution and reducing emissions of heavy metals from coal-fired power plants are obvious national management implications.

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